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ABSTRACT

Contained within this state science guidelines booklet are numerous resources to aid educational planners and decision makers in developing and selecting science curricula appropriate for grade levels K-12. Within the first section, the purpose, philosophy and a model for a science education program that promotes scientific literacy are provided. The second section presents the grade level expectations. Included within this section are exit objectives by grade level and example activities appropriate for the stated objective. Emphasized are important concepts, skills, and attitudes appropriate for a specific grade level. The organization of these concepts and processes is based upon developmental learning theories (levels specified are preoperational, concrete operations, and formal operational). The appendix contains supportive material (i.e., reference lists, classroom materials suggestions), including a directory of educators in Kansas who offer consulting assistance concerning mathematics and/or science programs. (CS)

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TENTATIVE GUIDELINES

FOR

TEACHING SCIENCE

K-12

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Serving as members of the Science Advisory Committee for the development of the state science guidelines booklet were science educators, classroom teachers, administrators, and scientists. Individually and collectively their counsel, comments, and constructive criticism proved to be a sound basis for the development of the guide.

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INTRODUCTION

PURPOSE

This guide is designed to provide a rationale and structure which will enable educational planners and decision makers to develop and select science curricula. The content within this publication is intended for use by administrators in charge of curriculum, departmental and district science chairpersons, and all teachers, citizens and students interested in science curriculum planning. The theories, models and structures provided are to be used as guides for developing programs which meet the specific needs and situations of individual districts. This guide is not a K-12 science program. It is hoped that as districts across the state of Kansas review and develop their science curriculum, that the objectives within this guide will be used as criteria for evaluation.

GOAL

THE GOAL OF SCIENCE EDUCATION IN KANSAS IS TO DEVELOP A SCIENTIFICALLY LITERATE CITIZENRY.

Scientific literacy is subdivided into the cognitive domain, affective domain and the psychomotor domain. The cognitive domain can be further subdivided into knowledge about science, which includes the nature of science, concepts within science and the interaction between science and society, and the processes of science. The affective domain includes the values and attitudes within science, and the interest and motivation to study science. The psychomotor domain encompases the manipulative skills necessary to operate as a scientist. It is the primary goal of science education to maximize the attainment of the objectives within each of the areas which lead to the development of a scientifically literate individual.

MODEL FOR SCIENCE EDUCATION

A rocket is used as the symbol for scientific literacy. Like a rocket, science can be envisioned as a vehicle to explore the frontiers of knowledge (Figure 1). The process skills of the scientist open a path to new realms of knowledge. The psychomotor skills, attitudes and concepts, are necessary to guide the scientifically literate person in the quest for a better understanding of himself and the world around him. It is the inherent force of problem solving that constitutes the thrust to search through irrelevant information and seek out possible solutions to meaningful questions.

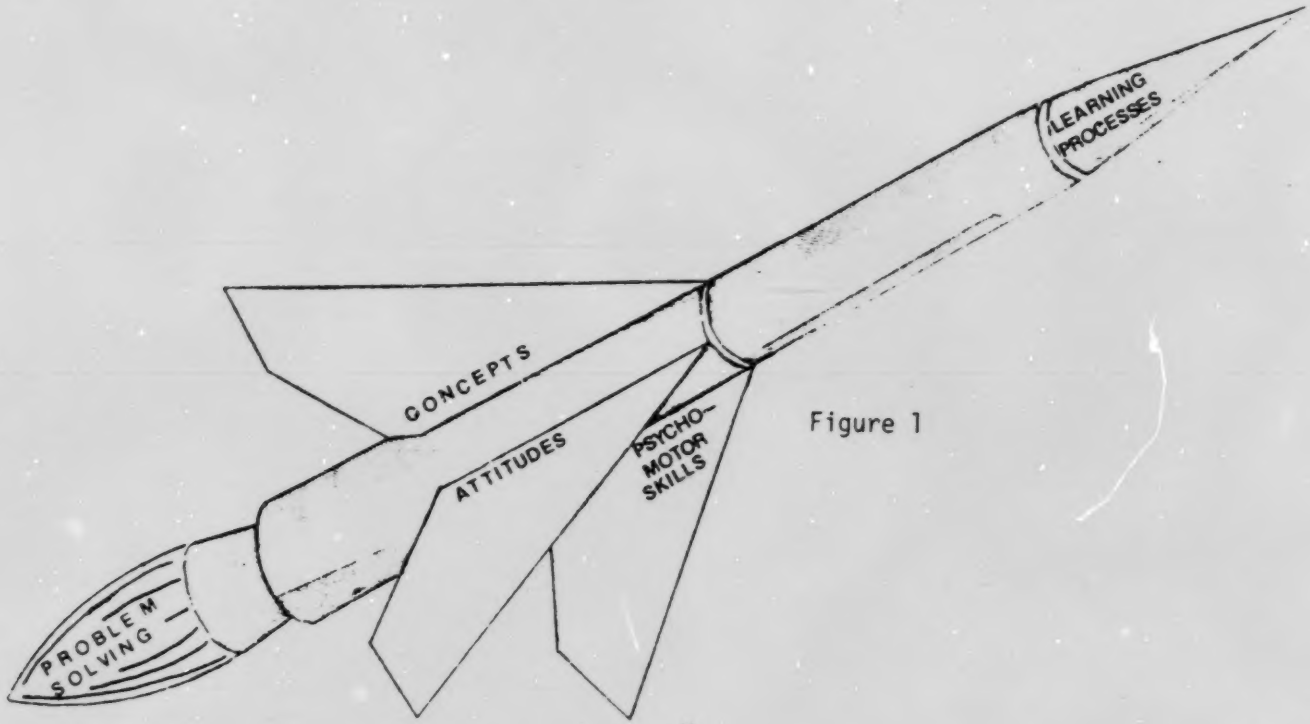


Figure 1

PSYCHOLOGICAL BASIS

The organization of the concepts and processes of science, as presented in this guide, is based upon developmental learning theories.

The three developmental levels of concern are preoperational, concrete operational and formal operational.

This guide has been developed in an effort to structure the curriculum which will allow for involvement of all learners in activities which are directed toward enabling the maximum level of learning.

Emphasis should be placed upon concrete experiences in the primary grades. In the intermediate grades, increasing emphasis is placed on experiences which involve abstract thinking and rely less on concrete experiences. Students in the Junior High/Middle School years should be involved in activities which encourage the use of thought at the formal operational level. In the High School science classes, abstract concepts should be developed through the use of all of the process skills. The student should, upon completion of the K-12 program, be operating as a scientifically literate person, capable of independently seeking out new relationships and forming new concepts.

LEARNING PROCESSES

The learning processes identify those necessary skills utilized in a logical approach to discovering knowledge. They enable students to achieve the skills necessary to survive in a technologically advanced society. The inclusion of the learning processes as the organizational framework is based upon the recognition of the dynamic nature of science. The realization of a scientifically literate society is dependent on the participation of all individuals in the process of science.

The learning processes can be subdivided into two phases. The basic skills phase deals with the gathering, organizing and reporting of relevant information. The integrated skills phase deals with the search for a discovery of relationships within the data. There is an ordered structure within the learning processes which results from the degree to which manipulations are performed with the observable data. Within the learner there also exists a developmental sequence which at different stages enables the mastery of specific skills.

Figure 2 incorporates these two dimensions into a model of instruction for the process skills. The verticle axis represents the K-12 sequence and the horizontal axis represents the sequence of learning processes. Region #1 (*) indicates the years at which specific skills are introduced. Throughout the years following the introduction of a particular skill, it is refined as indicated by Region #2 (*). Region #3 (*) of the model indicates the time zone in which it is inappropriate to deal with certain skills; because of the incompatability of the skill with the learner characteristics. The model of the learning process displays the relationship between the learner and the skills. Through implementation of the model, the learner at all stages of development will be refining and developing an ever increasingly sophisticated methodology for problem solving.

*Figure 2

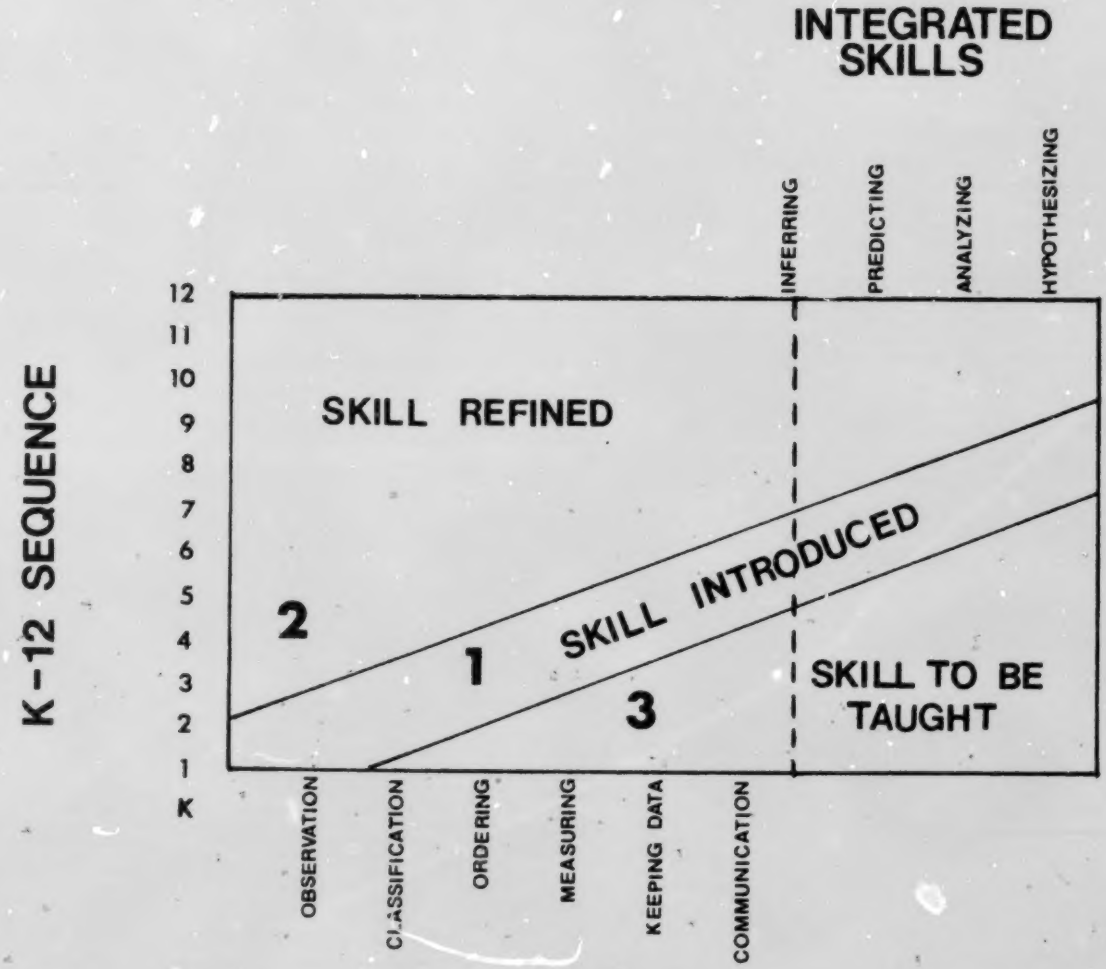
PSYCHOMOTOR SKILLS

Psychomotor skills include large and small muscle movement and eye-hand coordination. The development of manual dexterity and physical awareness are important goals of science education. In order to make observations, gather data and perform experiments, a student needs to become physically involved with the environment.

Scientific activities often involve very precise measurements and complicated manipulative procedures. To obtain useable data from which to build inferences, the physical component must be as exacting as possible.

In order to ensure safety when working with dangerous chemicals and equipment, the student must refine his fine motor movements. It is necessary to include goals, related to the development of psychomotor skills, thus minimizing the risks of injury when performing experiments. Even though science is largely thought of as a cognitive exercise, without direct physical involvement with the environment, the empirical data base for scientific study is unattainable.

LEARNING PROCESS MODEL OF INSTRUCTION



ATTITUDES AND VALUES

Attitudes and values determine the extent to which the processes of science are put to productive use. Only with a constructive attitude is the scientifically literate person able to explore the frontiers of knowledge. When misplaced values such as personal prejudice and dishonesty are represented, the scientific quest for truth is misguided and the ultimate destiny is not acheived.

There needs to be curriculum directed toward the development of positive attitudes toward science. Improved attitudes lead to higher motivation and involvement in the enterprise. Emphasis needs to be placed on the development of a scientific values system in order to ensure the success of scientific endeavors.

ORGANIZATION OF THE GUIDE

The Kansas Science Education Curriculum Guide is divided into three sections. The introduction has been used to describe the purpose, philosophy and rationale for science education. The second section presents the grade level expectations. The purpose of this section is to provide the curriculum planner with a scope and sequence model to guide in the development of a science program. Included in this section are exit objectives by grade level and example activities for each grade level which are appropriate for the stated objectives. The exit objectives delineate expectations for a student who has successfully completed that grade level. The grade level objectives are meant to provide a general framework for a science curriculum. They are in no way intended to be restrictive in nature. They are not a total curriculum in themselves. These objectives are presented to emphasize important concepts, skills and attitudes appropriate for a specific grade level.

Supportive information is presented in the appendix. Additional supplemental information may be added at future dates. Included in the appendix will be information on the human resource pool, relevant articles, a glossary, a bibliography and a list of science programs.

This guide is to be a reference. Additional supportive information and input will be included whenever the need arises. This guide should be used by curriculum planners as they develop new science programs and as they evaluate those in practice. Hopefully, through continued use of this guide, a gradual consistency and continuity will emerge in the K-12 science programs across the state of Kansas.

Scientific content, comprised of facts, concepts and generalizations, infuses the total K-12 science curriculum. Content is the end product of the learning processes. Emphasis has been placed on the development and refinement of the learning processes because it is through utilization of the processes that the content of science is obtained, organized and confirmed. To be fully cognizant of science, the learner must be aware of the nature and processes of science. To be merely aware of the end products of science does not signify the realization of scientific literacy.

It is assumed that complete understanding of scientific concepts required reasoning patterns at a higher level of learning. It is expected that only introduction and partial progress can be made from kindergarten through junior high. Therefore, the central task would be to provide concrete experiences that become the foundation for concept formation in higher level science. Facts and concepts should be incorporated as they are encountered during the natural progression through the learning processes. In order to further enhance the understanding of the scientific enterprise, additional focus should be placed on the following:

1) leaders in science throughout history,
2) contemporary social issues involving technological development,
3) the nature of the scientific enterprise, and
4) representative concepts in all areas of science.

PROGRAM OUTCOME OBJECTIVES

The student will be able to:

1. Value science as a way of learning and communicating about self, others and the environment.
2. Use scientific problem-solving and learning processes.
3. Demonstrate knowledge of representative scientific theories, assumptions, principles, laws, facts and their cultural and historical contexts.
4. Demonstrate the use of scientific knowledge and processes to clarify his values, examine issues, solve problems (both personal & social) and to satisfy personal curiosity.
5. Relate science learning to the planning and fulfilling of personal, social and career roles.
6. Use the appropriate language, tools and operations of science.
7. Value science for its contribution to continuing personal experiences.
8. Discover and learn the knowledge, skills, attitudes and values necessary to carry out career decisions.

GRADE LEVEL OBJECTIVES AND SKILLS

KINDERGARTEN

GENERAL CHARACTERISTICS OF STUDENT:

MENTAL

Imaginative
Short Attention Span
Self-centered
Little Control of Emotions
Honest
Curious

PHYSICAL

Constantly Active
(Large muscle movement more developed than small.)

OBJECTIVE: The Kindergarten science program will enable student to acquire and refine the following:

COGNITIVE DOMAIN

Concepts

CENTRAL FOCUS
Provide concrete experiences which become the foundation for concept formation in higher level science *

Learning Processes

CENTRAL FOCUS
Introduce:
OBSERVATION - IDENTIFYING AND ACQUIRING INFORMATION THROUGH THE FIVE SENSES.

AFFECTIVE DOMAIN

Attitudes

CENTRAL FOCUS
Provide experience for growth of:
Curiosity
Honesty
Imagination
Concern/Care
Self-confidence
Persistence

PSYCHOMOTOR DOMAIN

Manipulative Skill

CENTRAL FOCUS
Skills which would enable students to handle materials appropriate for large muscle development, i.e. magnifying lens.

**Rationale for concept statement: Complete understanding of scientific concepts requires reasoning patterns at an advanced level of learning.*

SEE APPENDIX "A" FOR MENTAL AND PHYSICAL REFERENCES

KINDERGARTEN
(cont.)

EXIT OBJECTIVES:

The student will be able to:

COGNITIVE DOMAIN	AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
Observe using the five senses	Demonstrate the growth of attitudes, i.e. curiosity, honesty, imagination, persistence and concern/care	Handle materials appropriate for level physical development

EXAMPLE:

Activities using the senses -- emphasis placed on exploring differences in size, shape, color, texture and etc.

Materials which could be used: leaves, rocks, shells, bottle caps, basic geometric shapes and any other appropriate materials.

FIRST GRADE

GENERAL CHARACTERISTICS OF STUDENT:

MENTAL	*PHYSICAL*
Imaginative - Dramatic	Large muscles more highly developed than small ones
Short Attention Span	
Individualistic	
Honest	Beginning to refine small muscle movement involving eye-hand coordination
Curious	
Emotions Not Too Well Controlled	

OBJECTIVE: The First Grade science program will enable students to acquire and refine the following:

COGNITIVE DOMAIN		AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
CONCEPTS	*LEARNING PROCESSES*	*ATTITUDES*	*MANIPULATION SKILL*
CENTRAL FOCUS	*CENTRAL FOCUS*	*CENTRAL FOCUS*	*CENTRAL FOCUS*
Provide concrete experiences which become the foundation for concept formation in higher level science *	Emphasize: Observation Introduce: *CLASSIFICATION - SORTING INTO GROUPS ACCORDING TO PROPERTIES* **	Provide experience for growth of: Curiosity Honesty Imagination Concern/Care Self-confidence Persistence	Skills which would enable students to handle materials appropriate for large muscle development, i.e. magnifying lens, eye dropper, and/or other appropriate materials

* *Rationale for concept statement: Complete understanding of scientific concepts requires reasoning patterns at an advanced level of learning.*

** *Observable Characteristics*

FIRST GRADE
(cont.)

EXIT OBJECTIVES:

The student will be able to:

COGNITIVE DOMAIN	AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
Sort into groups according to observable properties.	Demonstrate the growth of attitudes, i.e., curiosity, honesty, imagination, persistence and concern/care.	Handle materials appropriate for physical development, i.e., magnifying lens, eye dropper, etc.

EXAMPLE:

Provide experiences in activities whereby the students can disseminate, sort and arrange likenesses and differences according to common properties, living and non-living materials.

Materials which could be used: Anything living or non-living that is appropriate.

SECOND GRADE

GENERAL CHARACTERISTICS OF STUDENT:

MENTAL	*PHYSICAL*
Short attention span Desires to please and excel Urge for leadership and responsibility Wants independence but seeks security	Very active Big muscle movement still more developed than small muscle Eye-hand coordination continues to be refined

OBJECTIVE: The second Grade science program will enable student to acquire and refine the following:

COGNITIVE DOMAIN		AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
Concepts	*Learning Processes*	*Attitudes*	*Manipulative Skill*
CENTRAL FOCUS Provide concrete experiences which become the foundation for concept formation in higher level science*	*CENTRAL FOCUS* Emphasize: Observation Classification Introduce: *ORDERING - RANKING OBJECTS ACCORDING TO COMMON PROPERTIES***	*CENTRAL FOCUS* Provide experience for growth of: Curiosity Honesty Imagination Concern/Care Self-confidence Persistence	*CENTRAL FOCUS* Skills which would enable students to handle materials appropriate for large muscle development and eye-hand coordination (i.e. using thermometers, measuring devices, timing devices and other appropriate materials)

* *Rationale for concept statement: Complete understanding of scientific concepts requires reasoning patterns at an advanced level of learning.*

** *Observable Characteristics*

SECOND GRADE
(cont.)

EXIT OBJECTIVES:

The student will be able to:

COGNITIVE DOMAIN	AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
Rank objects according to common properties	Demonstrate the growth of attitudes (i.e. curiosity, honesty, imagination, persistence, and concern/care)	Handle materials appropriate for physical development

EXAMPLE:

Provide experiences whereby the student can:
1) *Serial order (i.e. smallest to largest, tallest to shortest, lightest to heaviest, etc.)*
2) *Measure temperature daily using thermometer*
3) *Set time using wall clock to measure temperature*

Materials which can be used: sand, seasonal things, living organisms, etc.

THIRD GRADE

GENERAL CHARACTERISTICS OF STUDENT:

MENTAL	*PHYSICAL*
Short attention span	Large muscles more developed than smaller ones
Desires to assume responsibility but lacks skill with which to do it	Active
Wants praise and encouragement from adults	Energetic
Aware of individual differences	Eye-hand coordination continues to be refined
Curious	
Imaginative	
Sensitive	
Annoyed by conformity	

OBJECTIVE: The Third Grade science program will enable student to acquire and refine the following:

COGNITIVE DOMAIN

CONCEPTS

CENTRAL FOCUS

Provide concrete experiences which become the foundation for concept formation in higher level science*

LEARNING PROCESSES

CENTRAL FOCUS

Emphasize:
- Observation
- Classification
- Ordering

Introduce:
KEEPING DATA - REPRESENTING AND PRESERVING DATA IN AN ORGANIZED SYMBOLIC FORM

AFFECTIVE DOMAIN

ATTITUDES

CENTRAL FOCUS

Provide experience for growth of:
- Curiosity
- Honesty
- Imagination
- Concern/care
- Self-confidence
- Persistence

PSYCHOMOTOR DOMAIN

MANIPULATIVE SKILL

CENTRAL FOCUS

Skills which would enable students to handle materials appropriate for large muscle development and eye-hand coordination (i.e. using simple balances, thermometers, metric equipment, tape recorders, timing devices, magnets, and living things)

* *Rationale for concept statement: Complete understanding of scientific concepts requires reasoning patterns at an advanced level of learning.*

THIRD GRADE
(cont.)

EXIT OBJECTIVES:

COGNITIVE DOMAIN	AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
Keep data in a symbolic form	Demonstrate the growth of attitudes (i.e. curiosity, honesty, imagination, persistence and concern/care)	Handle materials appropriate for physical development

EXAMPLE:

Constructing a histogram using size of oranges, buttons, birthdays, raisins in cookies, eye color, etc.

Materials which can be used: oranges, buttons, shells, rocks, cookies, etc.

FOURTH GRADE

GENERAL CHARACTERISTICS OF STUDENT:

MENTAL

Capable of prolonged interest
May go ahead on his own
Wants to do things well
Gets discouraged under pressure
Argues over fairness
Wants group approval
Can be aggressive - needs responsibility

PHYSICAL

Very distinctive individual physical differences
Small motor development is getting better
Eye-hand coordination continues to be refined
Often gets overactive, hurried or careless, may have accidents
Prefer all one sex grouping

FOURTH GRADE
(cont.)

OBJECTIVE: *The Fourth Grade science program will enable students to acquire and refine the following:*

COGNITIVE DOMAIN

CONCEPTS

CENTRAL FOCUS:
Begin concept formation of:
Interaction
Variable
Systems/subsystems
Environment
Energy
Matter
Space/time
Cause/effect*

Additional Focus:
1) leaders in science throughout history,
2) contemporary social issues involving technological development, and
3) the nature of scientific enterprise.

LEARNING PROCESSES

CENTRAL FOCUS:
Emphasize:
- Observation
- Classification
- Ordering

Introduce:
MEASURING - A PROCEDURE FOR COMPARING AN OBJECT BY ASSIGNING A VALUE ASSOCIATED WITH A STANDARD UNIT **

KEEPING DATA - PERFORM MEANINGFUL MANIPULATIONS IN ORDER TO MAKE DATA EASIER TO UNDERSTAND

COMMUNICATING - TO EXCHANGE INFORMATION VERBALLY AND/OR NON-VERBALLY

AFFECTIVE DOMAIN

ATTITUDES

CENTRAL FOCUS:
Provide experience for growth of:
Curiosity
Honesty
Imagination
Concern/care
Self-confidence
Persistence

PSYCHOMOTOR DOMAIN

MANIPULATIVE SKILL

CENTRAL FOCUS:
Skills which would enable students to handle materials appropriate for level of development, i.e. using simple machines, living things, metric measurement devices, and timing devices
Simple balance
Constructing charts

* *Rationale for concept statement: Complete understanding of scientific concepts requires reasoning patterns at an advanced level of learning.*

** *Universally accepted quantity*

FOURTH GRADE
(cont.)

EXIT OBJECTIVES:

The student will be able to:

COGNITIVE DOMAIN	AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
1) measure two dimensionally 2) use charts to make data easier to understand 3) communicate information verbally and/or non-verbally	Demonstrate the growth of attitudes, i.e. curiosity, honesty, imagination, persistence and concern/care	Handle materials appropriate for physical development

EXAMPLE:

Chart the growth of plants and/or animals, types of rocks, weather events, etc.

Materials which could be used: simple machines, living things, metric measurement devices, timing devices, simple balances, charts, etc.

FIFTH GRADE

GENERAL CHARACTERISTICS OF STUDENT:

MENTAL

Willingness to work to receive recognition
Desires to become more independent
Willing to help others
Can cehck own progress
Group loyalty important
May go to great lengths to gain approval and respect of members of their own group
Enjoys group participation

PHYSICAL

Stronger muscles and longer bones
Increased resistance to disease
Girls are starting to mature
Eye-hand coordination refined

FIFTH GRADE
(cont.)

OBJECTIVE: The Fifth Grade science program will enable students to acquire and refine the following:

COGNITIVE DOMAIN

CONCEPTS

CENTRAL FOCUS:
Begin concept formation of:
Interaction
Variable
Systems/subsystems
Environment
Energy
Matter
Space/time
Cause/effect

Additional Focus:
1) leaders in science throughout history,
2) contemporary social issues involving technological development, and
3) the nature of scientific enterprise.

LEARNING PROCESSES

CENTRAL FOCUS:
Emphasize:
- Observation
- Classification
- Ordering
- Measuring
- Keeping Data

Introduce:
COMMUNICATION - EXCHANGE INFORMATION VERBALLY AND/OR NON-VERBALLY BY USING SEQUENTIAL SCIENTIFIC STEPS

INFERENCE - EXPLANATION OF AN OBSERVATION IN TERMS OF THE RELATIONSHIPS OF DATA COLLECTED

PREDICTION - THE ESTIMATION OF FUTURE EVENTS BASED ON THE RELATIONSHIPS OF DATA COLLECTED

AFFECTIVE DOMAIN

ATTITUDES

CENTRAL FOCUS:
Provide experiences for growth of:
Curiosity
Honesty
Imagination
Concern/care
Self-confidence
Persistence

PSYCHOMOTOR DOMAIN

MANIPULATIVE SKILL

CENTRAL FOCUS:
Skills which would enable students to handle materials appropriate for level of development, i.e. using microscope, metric equipment, heat source, glassware, charts and simple graphs, reference materials and resource people, compass and calculator
Devising and constructing simple apparatus for experiments

FIFTH GRADE
(cont.)

EXIT OBJECTIVES:

The student will be able to:

COGNITIVE DOMAIN

1) communicate in a sequential manner verbally and/or non-verbally

2) explain the same relationships between observations

3) predict a future happening based on data collected

AFFECTIVE DOMAIN

Demonstrate the growth of attitudes, i.e. curiosity, honesty, imagination, persistence and concern/care

PSYCHOMOTOR DOMAIN

Handle materials appropriate for physical development

EXAMPLE:

Use simple graphs as a form of communicating data

Use microscopes and other simple apparatuses in experiments

Materials which could be used: microscope, metric equipment, heat sources, glassware, charts, simple graphs, reference materials, resource people, compass, calculator, etc.

SIXTH GRADE

GENERAL CHARACTERISTICS OF STUDENT:

MENTAL

Loyalty to gang
Hero worship
Better ability to make judgment
Self-conscious
Desires to be independent and strong
Struggles between realistic and idealistic

PHYSICAL

Increased muscular coordination
Sexual characteristics developing
Rapid growth
More proficient in manipulative skills

SIXTH GRADE
(cont.)

OBJECTIVE: The Sixth Grade science program will enable students to acquire and refine the following:

COGNITIVE DOMAIN

CONCEPTS

CENTRAL FOCUS:
Begin concept formation of:
Interaction
Variable
Systems/subsystems
Environment
Energy
Matter
Space/time
Cause/effect

ADDITIONAL FOCUS:
1) leaders in science throughout history,
2) contemporary social issues involving development, and
3) the nature of scientific enterprise.

LEARNING PROCESSES

CENTRAL FOCUS:
Emphasize:
- Observation
- Classification
- Ordering
- Measuring
- Keeping Data
- Communication
- Inference
- Prediction

Introduce:
ANALYZING - SEARCHING FOR PATTERNS OR RELATIONSHIPS IN THE DATA COLLECTED

AFFECTIVE DOMAIN

ATTITUDES

CENTRAL FOCUS:
Provide experience for growth of:
Curiosity
Honesty
Imagination
Concern/care
Self-confidence
Persistence

PSYCHOMOTOR DOMAIN

MANIPULATIVE SKILL

CENTRAL FOCUS:
Skills which would enable students to handle materials appropriate for level of development, i.e. using microscope, thermometers, meter sticks, balance, volumetric equipment, timing devices, cameras, compasses, calculators, audiovisual equipment, reference materials and resource people, and heat sources.
Devising and constructing simple apparatus for experiment
Construction of charts and graphs

50

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SIXTH GRADE
(cont.)

EXIT OBJECTIVES:

The student will be able to:

COGNITIVE DOMAIN	AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
See patterns or relationships in the collection of data	Demonstrate the growth of attitudes, i.e. curiosity, honesty, imagination, persistence and concern/care	Handle materials appropriate for level of physical development

EXAMPLE:

Activities which show how science is related to other curriculum areas, i.e. structures in Art and Science, photography in the classroom, testing for starches, sugars, bases; graphing experiment results

Materials which can be used: microscopes, thermometers, meter sticks, volumetric equipment, timing devices, cameras, compasses, calculators, etc.

SEVENTH AND EIGHTH GRADES

GENERAL CHARACTERISTICS OF STUDENT:

MENTAL

Self-conscious at times
Wants peer approval
Wide fluctuation in emotions
Indifferent
Outgoing
Over generous
Have tendency to leave a situation when under emotional stress

PHYSICAL

Rapid growth - causes some lack of coordination
Continual refinement of eye-hand eye-foot coordination
Aware of physical growth
Boys are starting to mature
Girls are generally ahead of boys in development

SEVENTH AND EIGHTH GRADES
(cont.)

OBJECTIVE: The Seventh and Eighth grade programs will enable student to acquire and refine the following:

COGNITIVE DOMAIN

CONCEPTS

CENTRAL FOCUS
Begin concept formation of:
Interaction
Variable
Systems/subsystems
Environment
Energy
Matter
Space/time
Cause/effect

ADDITIONAL FOCUS
1) leaders in science throughout history,
2) contemporary soccial issues involving technological development, and
3) the nature of scientific enterprise.

LEARNING PROCESSES

CENTRAL FOCUS
Emphasize:
- Observation
- Classification
- Ordering
- Measuring
- Keeping data
- Communication
- Inference
- Prediction
- Analyzing

Introduce:
HYPOTHESIZING - FORMULATING A TESTABLE PREDICTION

AFFECTIVE DOMAIN

ATTITUDES

CENTRAL FOCUS
Provide experience for growth of:
Curiosity
Honesty
Imagination
Concern/care
Self-confidence
Persistence

PSYCHOMOTOR DOMAIN

MANIPULATIVE SKILL

CENTRAL FOCUS
Refinement of all skills safely using materials and scientific tools appropriate for seventh and eighth grades

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SEVENTH AND EIGHTH GRADES
(cont.)

EXIT OBJECTIVES:

The student will be able to:

COGNITIVE DOMAIN	AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
1) formulate a testable prediction 2) demonstrate an understanding of some of the concepts listed	Demonstrate the growth of attitudes, i.e. curiosity, honesty, imagination, persistence and concern/care	Handle materials appropriate for physical development

EXAMPLE:

Students set up and demonstrate experiments using the scientific method

NINE THROUGH TWELVE GRADES - SECONDARY

GENERAL CHARACTERISTICS OF STUDENT:

MENTAL

More self-confident
Determined
Discriminating
Self-controlled
More analytical about emotions
Good self-evaluators
Like to compete
More verbal
Think logically
Start to carry out symbolic operations mentally

PHYSICAL

Fine muscle control refined
Reach maturity

NINE THROUGH TWELVE GRADES - SECONDARY
(cont.)

OBJECTIVE: The Secondary science program will enable students to acquire and refine the following:

COGNITIVE DOMAIN

*CONCERNS**

CENTRAL FOCUS:
Cause/effect
Change
Cycle
Energy/matter
Entrophy
Equilibrium
Force
Fundamental particles
Interaction
Model
Orderliness
Organism
Probability
Population
Quantification
Replication
Scale
Symentry
System
Theory
Time/space

LEARNING PROCESSES

CENTRAL FOCUS:
Observation
Classification
Ordering
Measuring
Keeping data
Communication
Inference
Prediction
Analyzing
Hypothesizing

AFFECTIVE DOMAIN

ATTITUDES

CENTRAL FOCUS:
Persistence
Concern/care
Self-confidence
Curiosity
Honesty

PSYCHOMOTOR DOMAIN

MANIPULATIVE SKILL

CENTRAL FOCUS:
Reninement of all skills safely with the use and care of appropriate laboratory equipment
Use of safety in laboratory
Use of some instrument that records data as a function of time, such as a polygraph
Use of some electronic instrument that measures current as a function of some other physical variable, such as a pH meter

* *From What Is Unified Science Educational? (Part 5) Program Objectives and Scientific Literary" by Victor Showalter in collaboration with David Cox, Paul Holobrinko, Barbara Thomson and Mike Oriedo.*

NINE THROUGH TWELVE GRADES - SECONDARY
(cont.)

EXIT OBJECTIVES:

The student will be able to:

COGNITIVE DOMAIN	AFFECTIVE DOMAIN	PSYCHOMOTOR DOMAIN
1) demonstrate an understanding of most of the concepts which lead to scientific literacy	Demonstrate the growth of attitudes, i.e. curiosity, honesty, imagination, persistence and concern/care	Handle materials appropriate for physical development
2) exhibit an understanding of the learning processes involved with becoming scientifically literate		

EXAMPLE:

Curriculum areas taught at the high school level

"SUGGESTED READINGS"

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Resume

Kansas Human Resources

KS

Target Audience ADM, TEA, PROGDIR, ELEM

Person Zimmer, Nelson E., 216 E. 29th St., Hays, KS 67601 (913) 628-8756

Publications

Training Recs

Organization Assistant District Superintendent, Box 219, Hanston, KS 67849 (316) 623-2611, USD 228, Hanston, KS

Availability Fee $5.00 per hour or $40 per day; Expenses $20 per day. Flexible schedule.

Descriptors Mathematics; Mathematics Instruction; Educational Needs; Educational Objectives; Individualized Programs; Elementary Grades; Reading; Needs Assessment

Identifiers Kansas; USD 228, Hanston

Abstract Currently serves as principal of Hanston High School as well as assistant district superintendent. Describes areas of specialization as needs assessment-Delphi Technique; development of educational goals and objectives; individualized math; and individualized reading. Worked with the State Facilitator (Kansas) program in providing local adaptations of National Diffusion Network programs concerning individualization in reading and mathematics. Also established district-wide goals and objectives for total school system. References: James McElroy, Superintendent, USD 228, Hanston, KS 67849; and Weldon F. Zenger, Associate Professor of Education, Fort Hays State University, Hays, KS 67601.

End of Abstract

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APPENDIX

APPENDIX A

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APPENDIX B

ATTITUDES

Curiosity - a desire to find out -- wanting to know

Concern/care - to express an interest in, protection for or series attention to all living and non-living things -- become important

Imagination - creating mental pictures of how things might be -- envision another way to do something

Honesty - a sincere expression of trustworthiness, fairness and justice

Self-confidence - sure and confident in one's own ability -- willingness to try new things and take risks with new ideas

Persistence - a determination to continue with an experience which can last for sometime -- refusing to give up

APPENDIX C

CLASSROOM HINTS FOR THE TEACHER

Many of the activities used in teaching involve simple games, activity sheets for the students and simple objects that can be collected at a very low cost.

A PAPER SAVER

To save paper and allow students to practice, tape a long piece of plastic sheeting (like that used for winterizing a window) on a table. Use masking tape at each end and leave the sides free except at a few places. The students can use grease pencils to respond to practice sheets that are placed under the plastic. When they have finished and their work has been checked, the markings can be removed by wiping with a soft dry cloth. The practice sheets can be placed in a file for re-use ---- saves time at the mimeograph machine.

USE YOUR PANTYHOSE CARDBOARD HOLDER

New pantyhose and other clothing items frequently have a cardboard holder placed inside them. Save these cardboard items for making objects used in games and activities which are homemade.

CLEAR CONTACT PAPER

Clear contact paper can be used to cover game cards or other activity cards which are made. Covering them with this clear film allows them to be wiped off where they were marked with grease pencil. This allows the card to be used many times.

FILE FOLDERS

File folders on which games can be put can be covered with clear contact paper and used many, many times. Also, they are very easily stored.

ADDING MACHINE TAPE

Another idea is to use adding machine tape for students to do mathematics exercises, practice spelling words, etc. Cut a 1/4" dowel stick about six inches long. Put atting machine tape on dowel stick, then tape both ends of dowel to desk. As students need paper to practice on, they can just roll off as much as they need.

BABY FOOD JARS

For doing some activities, baby food jars can be used. To plant seeds, make small terrariums, aquariums, keep aged water in, etc. Also, zip lock bags are good to use for many activities.

This is just the beginning of classroom hints for teachers. New hints will be coming at various times during the school year. If you would like to add to the hints, please send your name to the Kansas Department of Education.

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APPENDIX D

HUMAN RESOURCE GUIDE

INTRODUCTION

Kansas has a large number of competent educators in the mathematics and science fields. A number of these educators are offering their services as technical assistants to local schools that perceive need for consultative assistance. This directory includes pertinent information about these persons so that schools seeking consultative assistance concerning their mathematics and/or science programs may select those who can best serve their particular needs.

HOW TO USE THIS DIRECTORY

This directory of mathematics and science consultants has been categorized to reflect the level(s) (elementary, secondary, postsecondary, higher education) at which the consultant has indicated he/she most frequently works (Levels Index which precedes the resumés). Within the four levels, skills areas are supplied for each name and names are listed alphabetically (Subject Indexes which follow the resumés). The number opposite the name refers to the page on which the resumé appears.

The resumés have been prepared in a format suitable for computerized retrieval. The key to the determination of a consultant's skills area(s) and more specific grade levels are reflected by the descriptors in the resumé.

The code used to designate the target audience and levels (on resumé) is necessary to meet space requirements for computerization. Please see the following pages for a list of the codes and identification. The codes for both mathematics and science are listed alphabetically in a single list.

More information about the consultant's skills, education, and experience is in the abstract. The abstract also includes two names of reference. Please note, however, that the KEDDS Human Resources file (the technical assistants in mathematics and science are a part of that file) is still in the development stage. Persons are entered in the file as they apply, and time is required to contact and receive letters from references whose names are supplied by the applicant. For that reason, some of the resumés may not include references at this time.

CODE LETTERS FOR TARGET AUDIENCE

MATHEMATICS AND SCIENCE

ADM	Administrators
ADT	Adults
BILED	Bilingual Educators
CARED	Career Educators
CHEMTEA	Chemistry Teachers
COLLSTU	College Students
CUCORD	Curriculum Coordinators
EDUCSPEC	Educational Specialists
ELEM	Elementary Education
ELEMTEA	Elementary Teachers
ENVIRED	Environmental Education
GENPUB	General Public
HIED	Higher Education
HISCHSTU	High School Students
INTM	Intermediate Grades
JRCOLLSTU	Junior College Students
JRHI	Junior High Schools
KDG	Kindergarten
LOCSCHPER	Local School Personnel
MATH	Mathematics
MATHTEA	Mathematics Teachers
MIDSCH	Middle Schools
PARAPROF	Paraprofessionals
PAR	Parents

(continued on next page)

PARGRPS	Parent Groups
PARTUT	Parent Tutors
PARVOL	Parent Volunteers
PHYSICSTEA	Physics Teachers
POSTSEC	Post Secondary Education
PRESERTEA	Preservice Teachers
PRIM	Primary Grades
PRIN	Principals
PROGADM	Program Administrators
PROGDIR	Program Directors
SCHPER	School Personnel
SCI	Science
SCISTUD	Science Students
SCITEA	Science Teachers
SEC	Secondary Education
SECSTU	Secondary Students
SRHI	Senior High
TEA	Teachers
YTHLEAD	Youth Leaders

TECHNICAL ASSISTANTS

Mathematics

(Index to Levels)

	Page	E.	S.	P.S.	H.E.
Beamgard, Bill	1	X	X		
Benson, Sterling O.	2	X			
Berens, Ronald J.	3		X		
Coltharp, Forrest L.	4	X			
Cuppy, Nelda K.	5			X	
DeFries, Pam A.	6	X			
Dorsett, Bessie M.	7	X			
Fernkopf, Forrest D.	8	X			
Gladfelter, Robert G.	9		X		
James, Robert K.	10	X	X		
Jameson, Allen A.	11		X		
Johnson, Ralph L.	12	X	X		
Keiter, Joann E.	13	X	X		
King, Marjorie L.	14	X			
Kurtz, Ray V.	15	X			
Martinson, Donald C.	16		X		
Muller, Adelyn C.	17	X			
Olson, John R.	18		X		
Pickering, Dennis A.	19	X	X		
Riegel, Arvilla C.	20	X			

	Page	E.	S.	P.S.	H.E.
Robb, Gloria A.	21	X			
Roeser, Betty E.	22	X			
Schroeder, Edgar E.	23	X			
Sorenson, Louise N.	24	X			
Truby, Charlotte C.	25	X		X	
Zimmer, Nelson E.	26	X			
Ziska, Phyllis J.	27	X			

Resume

Kansas Human Resources

KS

Target Audience TEA, CUCORD, MATH, KDG, ELEM, SEC, PRONEG

Person Beamgard, Bill, 502 N. Third Street, Atwood, KS 67730 (913) 626-3020

Publications

Training Rscs Overhead projector

Organization Mathematics Instructor, Atwood High School, Atwood, KS 67730 (913) 626-3280, USD 318, Atwood, KS

Availability Fee None; Expenses $23. Prefers weekends; could be available 1 or 2 weekdays, if necessary

Descriptors Mathematics; Curriculum; Programs; Elementary School Teachers; Secondary School Teachers; Collective Negotiation

Identifiers Kansas; USD 318, Atwood

Abstract Presently teaches mathematics in a four year high school at Atwood. Holds Master's degree in school administration and has taken 3 different mathematics curriculum studies. Names specific areas for consultative services as mathematics curriculum and programs, K-12; and professional negotiation activities. Served as professional negotiator for district for 1 year and has been committee member for several years. References: Louis Holaday, District Superintendent and Verle McClellan, Principal, Atwood High School, USD 318, Atwood, Kansas 67330.

End of Abstract

Kansas Human Resources

KS

Target Audience: TEA, KDG, ELEM

Person: Benson, Sterling O., 501 W. Saline, Lindsborg, KS 67456 (913) 227-3633

Publications:

Training Rscs: Room with tables; overhead projector; balance scales; metric measuring graduals (for metric workshop)

Organization: Coordinator of Elementary Education, Bethany College, Lindsborg, KS 67456 (913) 227-3312, Ext 19

Availability: Fee $100 per day; Expenses $30 per day plus 15¢ per mile. Has flexible schedule

Descriptors: Mathematics; Mathematics Education; Metric System; Workshops; Elementary School Mathematics

Identifiers: Kansas; Bethany College, Lindsborg

Abstract: Presently is coordinator of elementary education at Bethany College. Has been classroom teacher and college level math teacher. Special skills are listed as mathematics education; elementary school mathematics; and metric workshops. Previous consulting experience includes involvement in the Nebraska Helpmobile project which focused on individualization of mathematics in the intermediate grades and holding metric workshop for teachers in the Kansas National Education Association Uniserve District 1. References: Don Anderson, Executive Director, Uniserv, 101 S. Main, Box 470, Lindsborg, KS 67456; and Dr. T. Von Fange, Bethany College, Lindsborg, KS 67456

End of Abstract

Resume

Kansas Human Resources

KS

Target Audience TEA, JRHI

Person Berens, Ronald J., 2818 25th St., Great Bend, KS 67530 (316) 793-7029

Publications

Training Rscs

Organization Department Chairman and Instructor of Mathematics, Junior High School, 2818 25th St., Great Bend, KS 67530, (316) 793-7029, USD 428, Great Bend, KS

Availability Fee optional; Expenses optional. Availability not listed; contact for times available.

Descriptors Mathematics; Mathematics Instruction; Junior High School; Learning Activities

Identifiers Kansas; USD, Great Bend

Abstract Currently is employed as a mathematics instructor and department chairman in a Great Bend junior High. Describes area of specialization for consultative assistance as the use of calculators in a junior high mathematics program. Has served as a member of evaluating team for the North Central Evaluation Association. References: Glen Erikson, Assistant Superintendent, USD 428, 2408 Jefferson, Great Bend, KS 67530; and William Vossen, Principal, Harrison Junior High School, 1919 Harrison, Great Bend, KS 67530.

End of Abstract

KS

Target Audience ELEMTEA, PARGRPS

Person Coltharp, Forrest L., 1402 W. Homer, Pittsburg, KS 66762 (316) 231-3515

Publications

Training Recs

Organization Professor of Mathematics, Department of Mathematics, Pittsburg State University, Pittsburg, KS 66762 (316) 231-7000, Ext 323

Availability Fee $100-200 per day; Expenses $32 per day. Available three days a week and evenings.

Descriptors Mathematics; Mathematics Education; Metric System; Elementary School Mathematics;

Identifiers Kansas; Pittsubrg State University, Pittsburg

Abstract Responsibilities as professor of mathematics at Pittsburg State University involve both preservice and inservice mathematics education at the elementary level. States areas of specialization are metric education and all facets of elementary school mathematics. Holds Ed. D. from Oklahoma State University. Has furnished consultative service for various school systems throughout Kansas, Missouri and Oklahoma as well as for commercial book companies. References: Dr. Ramona Anschutz, Mathematics and Science Programs Specialist, Kansas State Department of Education, 120 E. 10th St., Topeka, KS 66612; and Ray Kurtz, Professor, Department of Curriculum and Instruction, College of Education, Holton Hall, Kansas State University, Manhattan, KS 66506

Resume

Kansas Human Resources

KS

Target Audience: TEA, JRCOLLSTU, POSTSEC

Person: Cuppy, Nelda K., Moran, KS 66755 (316) 237-4522

Publications

:

Training Rscs

Organization: Mathematics Instructor, Allen County Community Junior College, 1801 N. Cottonwood, Iola, KS 66749 (316) 365-5116

Availability: Fee not listed; Expenses not listed. Limited availability throughout the school week.

Descriptors: Mathematics; Mathematics Education; Learning Activities; Post Secondary Education

Identifiers: Kansas; Allen County Community Junior College, Iola

Abstract: Currently is mathematics instructor at community junior college. Professional education includes M.S. in mathematics, Pittsburg State University, Pittsburg, Kansas. Has done additional graduate work at other institutions. Specialization area is focused on mathematics education. Has organized annual math relays-contests concerning mathematical topics for community college students and which have proven quite successful. References: Dr. Terry Glenn, Vice-President and Dean of Instruction, Allen County Community Junior College, Iola, KS 66749; and Sam Newland, Community Junior College Specialist, Kansas State Department of Education, 120 E. 10th St., Topeka, KS 66612

End of Abstract

KS

Target Audience: ELEMTEA, MATH, READ

Person: DeFries,Pam A., 1510 C Lane, Apt 116, Topeka, KS 66604 (913) 233-1442

Publications:

Training Rscs:

Organization: Title I Resource Teacher, Highland Park Elementary School, 2717 Illinois, Topeka, KS 66605 (913) 232-8270; USD 501, Topeka, KS

Availability: Fee negotiable; Expenses negotiable. Contact for possible time.

Descriptors: Reading; Mathematics; Criterion Referenced Materials; Individualized Programs; Elementary Grades; Learning Laboratories; Remedial Programs; Management

Identifiers: Kansas; USD 501, Topeka; Title I; Hoffman Laboratory

Abstract: Presently is employed as a Title I elementary school resource teacher. Is in charge of remedial math and reading laboratory (Hoffman) and in direction of two full-time certified aides. Education and/or training includes Hoffman workshops master classes in individualizing of reading. Prefers consulting services assistance in the areas of organization of criterion referenced materials; organization of remedial laboratory; and individualization in mathematics and reading. References: Virgil J. Funk, Principal, Highland Park Elementary School, 2717 Illinois, Topeka, KS 66605; and Wilmer Moffett, Coordinator of Title I, 1601 Van Buren, Topeka, KS 66612.

End of Abstract

Resume

Kansas Human Resources

KS

Target Audience: ADM, TEA, PARVOL, KDG, ELEM

Person: Dorsett, Bessie M., 3510 South Handley, Wichita, KS 67217 (316) 522-3255

Publications

:

Training Rscs

Organization: Coordinator of Math Laboratory Aides, Murdock Teachers Center, 670 N. Edgemoor, Wichita, KS 67208 (316) 682-4598, USD 259, Wichita, KS

Availability: Fee not listed; Expenses $25 per day. Available after 4:30 weekdays during school term; workshops and inservice available Saturdays and summers.

Descriptors: Mathematics; Mathematics Instruction; Learning Laboratories; Mathematical Concepts; Volunteers; Teacher Aides; Elementary School Mathematics; Parent Participation; Reinforcement; Training

Identifiers: Kansas; USD 259, Wichita

Abstract: Present job responsibilities involve providing preservice and inservice training sessions for mathematics aides, visiting the mathematics laboratories [illegible]onitor the program and assisting the aides in implementation. Receive[illegible] actual training for 3 years as instructional aide and has spent four years as coordinator of math laboratory aides. Was member of a 3-person team from Murdock Center who presented workshop for the Garnett public school system. Also, has worked with parent volunteer groups in USD 259. Areas of specialization include presenting and demonstrating procedures for implementing an innovative math laboratory by utilization of activities which stress reinforcement of mathematical concepts. Also can offer techniques for obtaining volunteer parents and how to provide training sessions for instructional aides. References: Kenneth E. Young, Superintendent of Schools and Danny Harper, District Math Specialist, USD 365, Garnett, KS 66032.

End of Abstract

Resume

Kansas Human Resources

KS

Target Audience TEA, PRIN, KDG, ELEM

Person Fernkopf, Forrest D., 2521 Sunset Road, Topeka, KS 66614 (913) 272-1236

Publications

Training Rscs

Organization Principal, Bishop Elementary School, 3601 S.W. 31st St., Topeka, KS 66614 (913) 272-8610, USD 501, Topeka, KS

Availability Fee none; Expenses $50 per day. Afternoons preferred; could arrange for entire day.

Descriptors Mathematics; Mathematics Instruction; Open Education; Elementary Grades

Identifiers Kansas; USD 501, Topeka

Abstract As principal of Bishop School in Topeka, is responsible for organization, coordination and supervision of elementary grade program. States areas of consulting assistance as the demonstration of a basic handwriting program, K-6, utilizing two kits of film loops; demonstration of basic math factsfilm loops; and presentation of lecture and slide-tape demonstration on open facilities and program of Bishop School. Background for consultative assistance includes demonstrations of handwriting film-loop materials for elementary faculty groups and for college classes. Has also served as a professional consultant to a publishing company. References: Dr. W. R. Oldham, Director Education Department/Graduate Division, Washburn University, Topeka, KS 66621; and Dr. Owen Henson, Associate Superintendent, Education Division, USD 501, 415 W. Eighth, Topeka, KS 66603

Resume

Kansas Human Resources

KS

Target Audience: TEA, PHYSED, MATH, SEC

Person: Gladfelter, Robert G., 2516 Moundview, Topeka, KS 66614 (913) 272-9062

Publications:

Training Rscs:

Organization: Mathematics Teacher and Tennis Coach, Topeka West High School, 2001 Fairlawn, Topeka, KS 66604 (913) 272-1643, USD 501, Topeka, KS

Availability: Fee $7.00 per hour or $75 per day; Expenses $8.00 food and 15¢ per mile. Prefers the months, December through February and June through August. Evenings Monday - Saturday

Descriptors: Mathematics; Mathematics Instruction; Secondary Grades; Physical Education; Tennis

Identifiers: Kansas; USD 501, Topeka

Abstract: Current job responsibilities include teaching mathematics and coaching tennis for men and women at the secondary level. As mathematics major, received B.A., Washburn University in 1969. Mathematical topics for consultative services are algebra, geometry and alg-trig. Coaching skills focus on the strategy and techniques of tennis. References: Roger L. Dirks, Director of Continuing Education Services, Topeka Public Schools, 1900 Hope St., Topeka, KS 66604; and Donald E. French, Assistant Principal, Topeka West High School, 2001 Fairlawn, Topeka, KS 66604.

End of Abstract

Resume

Kansas Human Resources

KS

Target Audience TEA, SCI, MATH, ELEM, SEC, PRESERTEA

Person James, Robert K., Westwind Street, Manhattan, KS 66502 (913) 539-5569

Publications

Training Rscs Can provide any special equipment needed

Organization Professor, Science and Environmental Education, College of Education, Holton Hall, Kansas State University 66506 (913) 532-5528

Availability Fee $100 per day; Expenses $35 per day. Generally available.

Descriptors Environmental Education; Science; Science Education; Metric System; Secondary School Science; Elementary School Science; Performance Based Education; Curriculum; Teacher Education; Workshops; Mathematics

Identifiers Kansas; Kansas State University, Manhattan

Abstract As a professor of education, position responsibilities include providing science education for K-12 schools. Bachelor's and advanced degrees were attained in the areas of science education and competency based teacher education. Describes specialization areas as curriculum design, implementation, and evaluation; implementation of competency based education; workshops and consultant activities related to change in the elementary school science curriculum and secondary level science education; and workshops/consulting assistance on the metric system. Has had consulting experience in all of the described areas. References: Louis L. Hendricks, Field Representative, Silver Burdett Book Co., R.R. 1, Wamego, KS 66547; and Leslie S. Weller, Superintendent of Schools, USD 487, Herington, KS 67449.

Resume

Kansas Human Resources

KS

Target Audience: MATH, CARED, TEA, SRHI

Person: Jameson, Allen A., R.R.2, Box 283, Pittsburg, KS 66762 (316) 231-4275

Publications

:

Training Rscs

Organization: Mathematics Teacher, Pittsburg High School, 1310 N. Broadway, Pittsburg, KS 66762 (316) 231-2400, USD 250, Pittsburg, KS

Availability: Fee $100 per day; Expenses $35 per day plus mileage. Available weekends December through May (evenings if distance is not too great).

Descriptors: Mathematics; Secondary Grades; Career Education; Practical Mathematics

Identifiers: Kansas; USD 250, Pittsburg

Abstract: Currently is a teacher of mathematics, including the traditional courses and career math, at Pittsburg High School. Special skills focus is a non-book oriented approach to teaching of math which relates to need to survive day-to-day living (includes involvement of members of the community in the process). Has provided inservice presentation (1976) for Wichita Public Schools and made presentation at the 1977 Kansas National Education Association state convention. Also has had visitors from other schools to learn about the Pittsburg Program. References: Gail Garrison, USD 250, Pittsburg, KS 66762 and David Huffman, Ass't Superintendent, Board of Education USD 250, 510 Deill, Pittsburg, KS 66762.

End of Abstract

Resume

Kansas Human Resources

KS

Target Audienc ADM, TEA, MATH, READ, ELEM, SEC

Person Ralph L. Johnson, 604 S. 19th, Leavenworth, KS 66048 (913) 682-5431

Publications

Training Rscs

Organization Director, Special Services, USD #453, 624 Olive, Leavenworth, KS 66048 (913) 682-5971

Availability No fees; Expenses $35 - $40 per day, plus 13¢ per mile. Available as schedule allows.

Descriptors Diagnostic Teaching; Elementary Education; Mathematics; Secondary Education; Reading; Reading Diagnosis; Reading Skills; Remedial Programs

Identifiers Kansas; USD #453, Leavenworth; Project Pegasus; Title I

Abstract Presently serves USD #453 as Director of Title I programs, school health services, adult education and assists with inservice and curriculum. Special skills areas include Project Pegasus, a management system for the teaching of elementary reading skills, and Title I diagnostic/prescriptive teacher concept applied to local Title I reading and math programs. Holds an M.S. in psychology and administration and has completed additional graduate work in remedial reading, learning disabilities and curriculum. Participated in training for the Pegasus program. References: Frank Kukuk, Supt. and Dr. Truman Burton, Ass't Supt., USD #453, 624 Olive Street, Leavenworth, KS 66048

Resume

Kansas Human Resources

KS

Target Audience: TEA, READ, MATH, READPROGADM, ELEM, SEC

Person: Keiter, Joann E., 423 Mimosa Drive, Haysville, KS 67060 (316) 522-3574

Publications

:

Training Recs

Organization: Director of Title I and Reading Specialist, USD 260, Administrative Offices, 120 E. Washington, Derby, KS 67037 (316) 788-2877

Availability: Fee $100 per day; Expenses $50 per day. Available upon request for services.

Descriptors: Elementary Grades; Remedial Mathematics; Remedial Reading; Secondary Education; Program Administration; Reading; Mathematics; Reading Programs

Identifiers: Kansas; USD 260, Derby; Title I

Abstract: Currently holds position as reading specialist and director of Title I. Received M.S., elementary education (reading) and has done postgraduate work at several Kansas universities. Previous professional experience includes teaching elementary level; reading specialist; reading consultant and director of Head Start. Consultant services are preferred in the areas of administration of reading; Title I math; and remedial reading. References: H. Bruce Quantic, Assistant Superintendent Instruction, USD 260, 120 E. Washington, Derby, KS 67037; and Richard L. Watson, Director, Reading Services Center, Wichita State University, 1847 N. Chautauqua, Wichita, KS 67214.

End of Abstract

Resume

Kansas Human Resources

KS

Target Audience TEA, KDG, ELEM

Person King, Marjorie L., 232 Willoesque, Wichita, KS 67209 (316) 943-8338

Publications

Training Rscs

Organization Mathematics Consultant, Murdock Teachers Center, 670 N. Edgemoor, Wichita, KS 67208 (316) 682-4597, USD 259, Wichita, KS

Availability Fee $12.50 per hour or $100 per day; Expenses $30 per day. Workshops: afternoon 4:30-6:30; Saturdays 9:00-4:00; Summers, advance scheduling

Descriptors Mathematics; Mathematics Instruction; Elementary School Mathematics; Manipulative Materials; Reinforcement; Metric System; Cross Age Teaching; Group Activities; Learning Laboratories; Workshops; Consultants

Identifiers Kansas; USD 259, Wichita

Abstract Currently a mathematics consultant for a Wichita teachers center. Responsibilities include teacher training (concept development and reinforcement activities) and monitoring of classroom activities concerning ongoing progress of mathematics program. Has attained M.S. in educational administration. Lists areas of specialization as development of manipulative materials and of reinforcement materials; awareness workshops in metrics; crossgrade level groupings and methods for recording student progress; presentation of small group activities and center-developed techniques; and classroom organization ideas. Consulting experience includes assistance in elementary math methods, 4 Kansas colleges; assistance in developing Title I math program, Garnett Schools; workshops in Haysville and Derby; and metric workshop, Tahlequah, OK. References: Coker J. Denton, Chairman Elementary Education Department, College of Behavioral Sciences, Northeastern Oklahoma State University, Tahlequah, OK 74464; and Danny Harper, District Math Specialist, USD 365, Garnett, KS 66032

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Resume

Kansas Human Resources

KS

Target Audience: ELEMTEA, GENPUB

Person: KURTZ, Ray V., 1805 Alabama Lane, Manhattan, KS 66502 (913) 539-6082

Publications: Who Should Place College Freshmen in Mathematics? Mathematics Teacher November69; Fourth Grade Division: How Much is Retained in Grade Five? Arithmetic Teacher January73; Diagnosis of Computational Difficulties, Bulletin of The Kansas Association of Teachers of Mathematics, Spring73; In-Service Training for Professionals, Educational Considerations, Fall74 A Model Program for an Integrated Mathematics-Science Classroom, School Science and Mathematics Journal, March75; The Metric Challenge, Kansas School Board Journal, July75.

Training Rscs

Organization: Professor, Department of Curriculum and Instruction, College of Education, Holton Hall, Kansas State University, Manhattan, KS 66506 (913) 532-5931

Availability: Fee varies according to situation, $100 per day (for commercial work); Expenses actual incurred. Normally available with some advance notice.

Descriptors: Mathematics, Comparative Education; Metric System; Elementary Grades; Learning Activities

Identifiers: Kansas; Kansas State University, Manhattan

Abstract: As a professor in curriculum and instruction department instructs classes in the teaching of mathematics at the elementary and middle school levels. Attained Ed.D., University of Nebraska in 1967. Has taught primarily at the college level. Designates areas of specialization for consulting as metrics (work session or talk); hand-held calculators (work session or talk); minimal competencies in math (talk); why are our mathematics scores dropping? (talk); elementary grades education in England (talk with slides); and selection of creative students with mathematical activities (talk and work session). References: Adelyn C. Muller, Mathematics Specialist, Mathematics Resource Center, 5300 W. 86th St., Shawnee Mission, KS 66207; and Forrest L. Coltharp, Professor of Mathematics, Department of Mathematics, Pittsburg State University, Pittsburg, KS 66762

End of Abstract

KS

Target Audience: TEA, SRHI, JRHI

Person: Martinson, Donald C., 1144 N. Gordon, Wichita, KS 67203 (316) 942-7120

Publications

Training Rscs

Organization: Mathematics Teacher, Wichita North High School, 1437 N. Rochester, Wichita, KS 67203 (316) 264-7351, USD 259, Wichita, KS

Availability: Fee $25 per hour or $85 per day; Expenses $25 and 15¢ per mile. Available Saturdays; Possible leave from school duties if requested far enough in advance.

Descriptors: Mathematics: Discovery Processes; Mathematics Curriculum; Secondary School Mathematics; Comparative Education

Identifiers: Kansas; USD 259, Wichita; International Teaching Fellow

Abstract: Present position is teacher of mathematics at Wichita North High School. Had served as the coordinator of the mathematics department prior to spending a year in Australia as an International Teaching Fellow. Previous consultative experiences include math consultant, pre-school institutes for Newton and Derby school systems. In school year 1977, taught Algebra I bilingually. Specializations include presentation of material on the discovery method; assistance in curriculum work; and a presentation comparing the American and Australian schools, based on time spent in Australia. References: Thomas W. Martin, Mathematics Teaching Specialist, Educational Services Building, 640 N. Emporia, Wichita, KS 67214; and Forrest L. Coltharp, Professor of Mathematics, Pittsburg State University, Pittsburg, KS 66762

End of Abstract

Resume

Kansas Human Resources

KS

Target Audience: TEA, ELEM

Person: Muller, Adelyn C., Lake Quivira, KS 66106, (913) 631-7882

Publications: Various Articles, Arithmetic Teacher; Brochures distributed by the Shawnee Mission school district: Award Winning Cadet Program, Student Teacher Program, and A Systems Approach for Learners in Mathematics; Adaptation of Madame Papy's Mini-Computer, Cuisenaire Reporter; Report on preparation of teachers, SMEAC/Science-Mathematics; IVT series in Mathematics used by Shawnee Mission schools.

Training Recs

Organization: Mathematics Coordinator, 5300 86th St., Shawnee Mission, KS 66207 (913) 381-8871, USD 512, Shawnee Mission, KS

Availability: Fee $20-25 per hour or $100-150 per day; Expenses $40 per day. Can arrange work schedule with 2 or 3 weeks' advance notice.

Descriptors: Mathematics; Mathematics Curriculum; Basic Skills; Metric System; Learning; Manipulative Materials; Inservice Teacher Education; Behavior Problems; Elementary Grades; Mathematics Instruction

Identifiers: Kansas; USD 512, Shawnee Mission; Cuisenaire

Abstract: Currently is the coordinator of mathematics education for the Shawnee Mission public schools. Attained PH.D., mathematics education, from Kansas State University, 1975. Has diverse background in providing consultative assistance including services furnished at the local school and higher education undergraduate and graduate levels. Has also participated in a number of internationally based conferences. Specialized areas of consulting services would be particularly directed to elementary math teachers, and include the metric system; Piagetian theory and implementation; elementary math curriculum; teacher inservice (general methods); teaching basic skills; learning behavior problems of elementary students; and manipulative materials (especially Cuisenaire). References: Dr. Frank Hendrickson, Principal, Boevers Elementary School, 9134 E. 46th St., Tulsa, Ok 74145; and Dr. Shirley Hill, Professor, University of Missouri at Kansas City, Kansas City, Mo.

End of Abstract

Resume

Kansas Human Resources

KS

Target Audience MATHTEA, SEC, GENPUB

Person Olson, John Royd, 1440 Pine St., Hoxie, KS 67740 (913) 675-3957

Publications

Training Rscs Nature of presentation will determine equipment needed.

Organization Chairman of Department of Mathematics, Hoxie High School, Hoxie, KS, 67740 (913) 675-3286, USD 412, Hoxie, KS

Availability Fee Flexible-determined by individual situation; Expenses, full payment one-to-one basis. Available throughout year by schedule; Prefers maximum of two days block, including travel time.

Descriptors Mathematics; Mathematics Curriculum; Secondary School Mathematics; Student Motivation; Learning Activities

Identifiers Kansas; USD 412, Hoxie

Abstract Currently is chairman of the department of mathematics, Hoxie High School. Holds Master's degree from the University of Kansas and has a number of hours of post Master's work. Previous consulting experience has been for the Kansas National Education Association UniServ unit at Colby on the subject of calculators; also has served as past chairman for inservice mathematics training, Northwest Kansas League. Lists areas of specialization as calculators in the classroom; programmable calculators as a low cost alternative to computer science; calculator applications; mathematics education; mathematics motivation; mathematics curriculum; the role of high school mathematics; and readings in mathematics for the high school student. References: James L. Davis, Principal, Hoxie High School, Hoxie, KS 67740; and Lou Kirby, Director, Northwest Kansas UniServ District 17, Box 449, Colby, KS 67701.

End of Abstract

Resume

Kansas Human Resources

KS

Target Audience: ADM, TEA, CUCORD, ELEM, MDSCH

Person: Pickering, Dennis A., R.R. 3, Box 152AA, Pittsburg, KS 66762 (316) 231-1329

Publications

:

Training Rscs

Organization: Curriculum Specialist and Assistant Professor, Department of Curriculum and Instruction, Pittsburg State University, Pittsburg, KS 66762 (316) 231-7000 Ext 297

Availability: Fee open; Expenses actual incurred. Contact for scheduling.

Descriptors: Curriculum Development; Curriculum Evaluation; Mathematics; Elementary School Mathematics; Middle Schools; Time; Management; Multimedia Instruction; Needs Assessment; Open Education

Identifiers: Kansas; Pittsburg State University, Pittsburg

Abstract: Presently is assistant professor and curriculum specialist. Achieved doctorate in curriculum and administration. Professional experience at local school level includes teaching in elementary school and junior high school (mathematics) and serving as a curriculum coordinator (science). Describes specialization areas (stressing use of multi-media approach in both small and large group situations) as curriculum development and evaluation; needs assessment; elementary school mathematics; classroom interaction analysis; open education; and time management. Consulting experience includes services to several Kansas school districts as well as to schools out of state. References: W.J. Sandness, Dean School of Education, Pittsburg State University, Pittsburg, KS 66762; and John B. Barnett, Chairperson, Curriculum and Administration, Pittsburg State University, Pittsburg, KS 66762.

KS

Target Audience: READTEA, MATHTEA, ELEM

Person: Riegel, Arvilla C., 204 N. Lakin St., Box 464, Lakin, KS 67860 (316) 355-6156

Publications:

Training Rscs:

Organization: Primary Teacher, Elementary School, Box 26, Lakin, KS 67860 (316) 355-6191, USD 215, Lakin, KS

Availability: Fee not listed; Expenses not listed. Contact for available time

Descriptors: Reading; Mathematics; Elementary Education; Primary Grades; Reading Instruction; Mathematics Instruction

Identifiers: Kansas; USD 215, Lakin

Abstract: Has been employed for 15 years as teacher of grade 1 in Lakin Elementary School. Professional education includes a Master's degree in elementary education and completion of 6 hours toward reading specialist. States areas of specialization as reading and/or mathematics and that services would be directed to primary teachers. References: Dorrell George, District Superintendent, and Charles Ireland, Principal, Elementary School, USD #215, Lakin, KS 67860.

End of Abstract

Resume

Kansas Human Resources

KS

Target Audience: TEA, KDG, ELEM

Person: Robb, Gloria A., 521 Akron, Augusta, KS 67010 (316) 775-6166

Publications

Training Recs

Organization: Mathematics Consultant, Murdock Teachers Center, 670 N. Edgemoor, Wichita, KS 67208 (316) 682-4597, USD 259, Wichita, KS

Availability: Fee $12.50 per hour or $100 per day; Expenses $30 per day. Workshops: Afternoons 4:30-6:30; Saturdays 9:00-4:00; Summers-contact well in advance.

Descriptors: Mathematics; Manipulative Materials; Elementary School Mathematics; Reinforcement; Metric System; Cross Age Teaching; Group Activities; Workshops; Mathematics Instruction; Learning Laboratories; Consultants.

Identifiers: Kansas; USD 259, Wichita

Abstract: Responsibilities as mathematics consultant for Wichita Teachers Center include conducting inservice training for teachers and monitoring classroom activities to insure ongoing progress of the mathematics program. Has achieved Master's degrees in elementary education from Emporia State University and in administration from Wichita State University. States areas of specialization as the development of manipulative materials to stress hands-on approach to teaching of mathematics; reinforcement techniques used to stress computational skills; providing awareness workshops in metrics; assistance in designing a mathematics program for cross grade level groupings and methods for recording student progress; and presentation of small group activities and center-developed techniques. In addition to other inservice, has provided 23 preservice workshops for Title I Elementary Mathematics Program. References: Coker J. Denton, Chairman, Elementary Education Department, College of Behavioral Sciences, Northeastern Oklahoma State University, Tahlequah, OK 74464; and Danny Harper, District Math Specialist, USD 365, Garnett, KS 66032.

End of Abstract

KS

Target Audience TEA, KDG, PRI

Person Roeser, Betty E., 352 N. James, Haysville, KS 67060 (316) 522-5479

Publications

Training Rscs Overhead Projector, Screen, Materials-tagboard, folders, etc.

Organization Title I Mathematics Consultant, Murdock Teacher Center, 670 N. Edgemoor, Wichita, KS 67201 (316) 682-4597, USD 259, Wichita, KS

Availability Fee $12.50 per hour or $100 per day; Expenses $35 per day. Available as position with school district allows.

Descriptors Mathematics; Elementary School Mathematics; Kindergarten; Primary Grades; Developmental Programs; Consultants; Mathematics Instruction

Identifiers Kansas; USD 259, Wichita; Title I

Abstract For the past 4 years has been a mathematics consultant for the Wichita public schools. Job responsibilities entail visiting primary classrooms, giving demonstration lessons and conducting inservice for teachers in Wichita. Also is mathematics consultant for primary bilingual room in Wichita. Past consultative experiences include being a lead teacher for the Wichita science program. Feels qualified to provide consultative services to teachers, K-3, in the area of developmental mathematics. References: Donald W. Hall, Assistant Superintendent, USD 480, Box 949, Liberal, KS 67901; and Donald R. George, Principal, Nelson Elementary School, USD 261, 245 N. Delos, Haysville, KS 67060.

KS

Target Audience TEA, PARVOL, ELEM

Person Schroeder, Edgar E., 7321 N. Meridian, Wichita, KS 67147 (316) 755-1132

Publications

:

Training Rscs

Organization Coordinator of Mathematics Education, Educational Services Building, 640 N. Emporia, Wichita, KS 67214 (316) 268-7856, USD 259, Wichita, KS

Availability Fee $100 per day; Expenses $35 per day. Has flexible schedule.

Descriptors Mathematics; Elementary School Mathematics; Mathematics Instruction; Metric System; Parent Participation; Volunteers; Management Systems; Learning Laboratories

Identifiers Kansas; USD #259 Wichita

Abstract As coordinator of mathematics education for the Wichita Public Schools, responsibilities include directing mathematics programs and activities, K-12. Holds Master's degree in mathematics and has worked with elementary teachers for the past several years. Consulting experience includes furnishing assistance to the Garnett school district in setting up a management system for their schools. Specific areas for consultative help are talks on metrics (member of Metric Speakers Bureau); management system for elementary mathematics insturction; and organizing elementary mathematics laboratories which involve parents as volunteers. References: Dr. Lawrence Bechtold, Director of Curriculum, USD 259, Educational Services Building, 640 N. Emporia, Wichita, KS 67214; and Dr. Douglas Hupp, Director of Title I, USD 259, 1847 N. Chautauqua, Wichita, KS 67214

End of Abstract

KS

Target Audience TEA, ELEM

Person Sorenson, Louise M., R.R. 5, Box 76, Salina, KS 67401, (316) 823-2036

Publications

Training Recs

Organization Intermediate Grades Mathematics Teacher, Hawthorne Elementary School, 715 N. 9th St., Salina, KS 67401 (913) 827-1070, USD 305, Salina, KS

Availability Fee none; Expenses none. Contact for services during summers only.

Descriptors Mathematics; Elementary School Mathematics; Mathematics Instruction; Intermediate Grades

Identifiers Kansas; USD 305, Salina

Abstract Presently is employed as a mathematics teacher of students in the intermediate grades (3-6) in the Salina school system. Area of specialization is stated as any facet of elementary mathematics. Attained M.S. in elementary mathematics, Florida State University, Tallahassee, Florida. Previous consulting experience includes teaching one college course (Marymount College) in mathematics for elementary teachers. References: Eva Velharticky, Principal, Hawthorne School, 1308 Highland, KS 67401; and Sister Mary Paul, President, Marymount College, Salina, KS 67401.

KS

Target Audience TEA, READ, MATH, ELEM, ADT, POSTSEC

Person Truby, Charlotte C., 1117 N. Walnut, Beloit, KS 67420 (913) 738-2185

Publications

Training Recs

Organization Primary Teacher, Beloit Elementary School, 12th and Bell, Beloit, KS 67420 (913) 738-3581; USD #273, Beloit, KS 67420

Availability Fee $13 per hour, $80 per day; Expenses $35 per day. Available during summers and evenings and/or weekends during school year.

Descriptors Reading; Curriculum Development; Remedial Reading; Mathematics; Remedial Mathematics; Elementary Education; Adult Education; Remedial Programs; Post Secondary Education

Identifiers Kansas; USD #273, Beloit

Abstract Currently works as a teacher, grade 1, on a 3-member team and has taught remedial reading, grades 1-6. Attained M.S. with specialization in reading, University of Missouri at Kansas City, and has achieved additional graduate credit. Has also had training in reading diagnosis. Indicates special skills are in the areas of planning curriculum or in remedial reading and/or mathematics programs. States services would be of value to adults or to teachers of children or adults who need assistance for remedial instruction in mathematics and reading. References: Gail Applebee, Principal, and Mrs. Dawna Gree, Co-team Teacher, Beloit Elementary School, Beloit, KS 67420.

End of Abstract

KS

Target Audience ADM, TEA, PROGDIR, ELEM

Person Zimmer, Nelson E., 216 E. 29th St., Hays, KS 67601 (913) 628-8756

Publications

Training Recs

Organization Assistant District Superintendent, Box 219, Hanston, KS 67849
(316) 623-2611, USD 228, Hanston, KS

Availability Fee $5.00 per hour or $40 per day; Expenses $20 per day. Flexible schedule.

Descriptors Mathematics; Mathematics Instruction; Educational Needs; Educational Objectives; Individualized Programs; Elementary Grades; Reading; Needs Assessment

Identifiers Kansas; USD 228, Hanston

Abstract Currently serves as principal of Hanston High School as well as assistant district superintendent. Describes areas of specialization as needs assessment-Delphi Technique; development of educational goals and objectives; individualized math; and individualized reading. Worked with the State Facilitator (Kansas) program in providing local adaptations of National Diffusion Network programs concerning individualization in reading and mathematics. Also established district-wide goals and objectives for total school system. References: James McElroy, Superintendent, USD 228, Hanston, KS 67849; and Weldon F. Zenger, Associate Professor of Education, Fort Hays State University, Hays, KS 67601.

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End of Abstract

KS

Target Audience: TEA, READ, MATH, KDG, PRI

Person: Ziska, Phyllis J., Route 1, Box 115H, Basehor, KS 66007 (913) 724-1285

Publications

Training Rscs: Table for display of materials

Organization: Primary Teacher, Basehor Elementary School, Basehor, KS 66607 (913) 724-1038, USD 458, Basehor, KS 66607

Availability: Fee not listed; Expenses not listed. Available evenings after 4:00 p.m. on schooldays and on Saturdays. School time would require a release.

Descriptors: Reading; Mathematics; Teacher Developed Materials; Kindergarten; Elementary Education Games; Teaching Techniques.

Identifiers: Kansas; USD 458, Basehor

Abstract: Currently works as a classroom teacher, grade 3, and is departmental teacher of all 3rd grade language arts. Professional education includes Master's degree with specialization in reading, Emporia State University. Would like to share many teacher-made games and ideas for reinforcing skills in mathematics and reading (has had two ideas published in Instructor magazine) with teachers, K-4 levels. References: David Norris, Principal, Elementary School; and Dr. Tony Stansberry, Superintendent, USD 458, Basehor, KS 66007

INTRODUCTION

Kansas has a large number of competent educators in the mathematics and science fields. A number of these educators are offering their services as technical assistants to local schools that perceive need for consultative assistance. This directory includes pertinent information about these persons so that schools seeking consultative assistance concerning their mathematics and/or science programs may select those who can best serve their particular needs.

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